

REMARKS/ARGUMENTS

Reconsideration and allowance in view of the following remarks are respectfully requested.

Claim 7 has been amended above to correct an obvious typographical error introduced by the September 24, 2008 Amendment.

Claims 1-4 were rejected under 35 USC 103(a) as being unpatentable over Nakae in view of Garvie or King. Claims 1, 2, 4 and 7 were rejected under 35 USC 103(a) as being unpatentable over Nakae in view of Hata, and claims 5 and 6 were rejected under 35 USC 103(a) as being unpatentable over Nakae in view of Kato and either Garvie or King. Finally, claim 8 was rejected under 35 USC 103(a) as being unpatentable over Nakae in view of Kato, Garvie or King and Hata. Applicant respectfully traverses these rejections.

In the Final Office Action, on page 9, the Examiner alleges that the limitation of the behavior of a water droplet onto the other surface (polished surface) with a ten points average roughness of no more than $1.71\text{ }\mu\text{m}$ "does not further define the constructed sensor element or the method of manufacture of the sensor element, but rather a property of the sensor that has such a polished surface." (emphasis added).

Applicant respectfully traverses the Examiner's allegation.

As clearly described in Applicants' specification, on page 3, lines 3 to 22, a water drop on a surface of a heater substrate may cause tensile stress around it, and the tensile stress may be large at the high operation temperature of the gas sensor element. Particularly, the tensile stress may be the largest at the heater substrate at which the operation temperature is the highest. In other words, the tensile stress is in proportion to the temperature of the gas sensor element.

Because the gas sensor element is integrally provided with a heater element, the heater element causes the other surface of the heater member to increase in temperature due to the heat of the heater member, and the other surface with a higher temperature causes tensile stress around the water droplet on the other surface. As clearly described in Applicants' specification, on page 26, lines 5 to 15 and in Fig. 9, if the first gas target surface (claimed other surface) 271 of the heater member has a polished surface having a ten points average roughness of more than 1.71 μm , the surface tension of the first gas target surface 271 will be reduced, causing a water drop 179 on the surface 271 to be widely spread on the surface 271 by the tensile stress. As noted above, this tensile stress is in proportion to the temperature of the gas sensor element.

Specifically, because the gas sensor element according to each of claims 1, 5, 7 and 8 is provided with the heater member and the surface 271 has a higher temperature when the gas sensor element (heater member) is operated, the surface 271 with a higher temperature would cause the water drop 179 to be widely spread if the surface 271 had ten points average roughness of more than 1.71 μm .

In other words, if no heater were integrally provided in the gas sensor element, the water drop 179 would not be widely spread so that a contacting area of the surface 271 is kept small.

Accordingly, the particulars of the behavior of the other surface of the heater member recited in each of claims 1, 5, 7 and 8 is not merely a property "of the sensor element having a polished surface", but of the combination of the heater member having the other surface with a higher temperature and the other surface with ten points average roughness of no more than 1.71 μm .

Thus, even if Garvie and King render obvious the basic concept of polishing of the surface, the surface roughness limitation in combination with the behavior

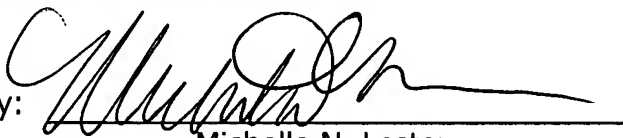
characteristic of the other surface of the heater member recited in each of claims 1, 5, 7 and 8 would not have been obvious from the prior art.

For all the reasons advanced above, reconsideration and withdrawal of the Examiner's prior art rejections of record and an early allowance of claims 1, 5, 7 and 8, and the claims depending therefrom, is respectfully requested.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in condition for allowance and an early Notice to that effect is earnestly solicited.

Respectfully submitted,

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